Indexal Thinking – Reconfiguring global topologies for market-based intervention

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ABSTRACT:

Through the example of a "regulatory ranking" – an index produced with the aim to regulate the pharmaceutical market by pushing companies in the direction of providing greater access to medicine in developing countries – we discuss indexing and ranking as infrastructural processes which inscribe global problem spaces as unfolding actionable territories for market intervention. We reflect on the "Indexal thinking" which structures and informs regulatory rankings - their aspiration to align the interests of different stakeholders and to entice competition among the ranked companies. We foreground the infrastructural work through which such ambitions are enacted, detailing processes of infrastructural layering/collage and patchwork through which analysts naturalize/denaturalize various contested categories in the ranking's territory. We reflect on the consequences of such attempts at reconfiguring global topologies for the problems these governance initiatives seek to address.

KEYWORDS:

1. ranking
2. infrastructure
3. global
4. territorialization
5. topology
6. access to medicine

Introduction

Rankings are expressions of an ascending mode of social organization by means of commensuration and competition (Espeland & Sauder, 2007; Espeland & Stevens, 1998; Jeacle & Carter, 2011; Kornberger & Carter, 2010; Mehrpouya & Samiolo, 2016; Pollock & D'Adderio, 2012; Sauder & Espeland, 2009; Scott & Orlikowski, 2012). Their diffusion marks the rise of benchmarking as the hallmark of 21st century forms of rule (Brown, 2015; Bruno, 2009; Bruno & Didier, 2015; Davies, 2014; Larner & Le Heron, 2004). Rankings are, in other words, prominent examples of the expansion and intensification of forms of "market thinking" in the calculative infrastructures of governance.

While we have gained fundamental insights into how rankings produce new configurations of discipline and decoupling (Sauder & Espeland, 2009) and invite a whole array of reactivity and reflexivity patterns from individuals and organizations (Espeland & Sauder, 2007; Pollock, D'Adderio, Williams, & Leforestier, 2018), the ways in which rankings are involved in bringing about new territories and scripts for action in different governance settings warrant further interrogating. This is especially the case given the increasing deployment of rankings in various facets of regulatory capitalism (Levi-Faur, 2005), as regulatory instruments used to harness competition to various social goals (Mehrpouya & Samiolo, 2016).

We attend to these issues by focusing on the information and calculative infrastructures underlying a ranking – known as the Access to Medicine Index – that aims to improve access to medicine in poor countries by building consensus among stakeholders and by enacting a competitive game among the 20 largest pharmaceutical companies variously active in those countries. We engage in the "infrastructural inversion" (Bowker & Carlson, 1994) of such ranking, attending to those "technologies and arrangements that, by design and by habit, tend to fade into the woodwork" (Bowker & Star, 2000, p. 34). We bring to fore the "thinking" aspects of infrastructure, attending to the governance aspirations, ideas and programs – governing global health by competition and consensus – which infuse the classifications, categorical work and patterns of relationality underlying this particular ranking. We examine how this ranking, as "product and process" (Star & Ruhleder, 1996, p. 111), "thinks" that which it classifies, measures and seeks to order, and how such thinking informs and transforms the ranking itself and inscribes the territories and agentic capabilities of those being ranked.

In particular, we focus here not so much on the consequences of rankings for concrete individuals and organizations, but on the ways in which the infrastructural processes underlying rankings generate particular scripts of action and configure the problem spaces onto which such action

is projected, inviting certain possibilities for deliberation and intervention at the expense of other possibilities.

The ranking examined here, for the purposes of selecting, comparing, scoring and ranking companies along the lines of dozens of indicators, is "invisibly supported" (Star, 1999) by existing classification systems drawn from international health policy and development debates. It operates through the articulation – at times an uneasy one – of such classification systems. This nested infrastructural arrangement has evolved over time in a more or less explicit conversation with those debates, selectively absorbing their programs and categories, but also provoking at times the disruption of existing categories and their underlying assumptions. The result is a particular topology (Collier, 2009; Lury, Parisi & Terranova, 2012) in which access to medicine as a problem space is constantly reconfigured and rendered actionable in particular ways.

Analyzing such topology requires attending to the territorializing role (Mennicken & Miller, 2012; Miller & Power, 2013) of rankings and of the infrastructures which make them up. Paraphrasing Miller and Power, we argue that rankings are "deeply involved in constituting the spaces in which [they are] active" (p. 577), and in so doing they can shape at once, in a mutually constitutive, open-ended fashion, spaces of intervention and the subjects of those interventions (Miller, 1992).

Stuart Elden (2013) has recently suggested that the notion of territory has been largely overlooked from a conceptual standpoint, despite its centrality to disciplines like geography, international relations and politics. Territory is usually understood as a bounded space within which certain forms of power are exercised, but little attention is paid to the "conditions of possibility of such a configuration" (Elden, 2013, p. 3). As Elden notes, at the same time when the calculated government of populations emerged within modern forms of government, territory co-emerged as a political technology going hand in hand with biopolitical tools for the management of populations. To govern the latter, the state had to begin to analyze its "territory". Territory emerged as "a rendering of the emergent concept of 'space' as a political category: owned, distributed, mapped, calculated, bordered, and controlled" (Elden, 2007, p. 578). Territory "is not simply an object: the outcome of actions conducted toward it or some previously supposedly neutral area. Territory is itself a process, made and remade, shaped and shaping, active and reactive" (2013, p. 17).

As much as "[t]he idea of a territory as a bounded space under the control of a group of people, usually a state, is therefore historically produced" (2007, p. 322), the post-national, global territory produced by contemporary governance discourses is a historical creation to be investigated in terms of the technologies which sustain it and reproduce it, and of the subjectivities which are made to unfold in it (Larner & Walters, 2004). This is even more the case when such space is non-hierarchical,

de-centered, and organized like a platform which invites and entices certain relations to form rather than directing them from a center (Kornberger et al., 2017).

The sphere of the global is often imagined as a "homogeneous, calculable space", an "abstract space we have imposed over the world", which is "taken more and more as real in itself, rather than as a reflection of something below it, something that it seeks to represent" (Elden, 2005, p. 16). This idealized, calculable, Cartesian space "becomes territory through acts of bounding and making visible" (Corner, 1999, p. 222, cited in Elden, 2013, p. 326), and processes of composing and binding together its elements according to specific rationales (Collier, 2009). That is, contrary to a common tendency to think the "global" as the outcome of a process of abstraction and de-territorialization, attention should be paid to the calculative practices whereby the global is re-territorialized in ways that transcend the boundaries of nation states. As Escobar put it, "[w]hen a border is eliminated, it reappears somewhere else" (2001, p. 139), delivering new politics of visibility, inclusion and exclusion.

Processes of territorialization can be grasped through the lenses of infrastructure (Harvey, 2012), attending to how infrastructures "make up and undo state-space through the ways in which they both posit and unsettle territories and populations, work across local, national and international spaces of law, history and aspiration, bringing past and future, interior and exterior together" (p. 89). It is to the role of rankings and their underlying infrastructures in these territorializing dynamics that we draw attention here – how rankings demarcate, calculate and sort out "global" problem spaces, making them visible and actionable in particular ways, binding together the actors and spaces of global governance in territorialization processes.

Rankings are becoming preferred ways of "knowing the global through calculative practices", thus allowing "the emergence of a global economic imaginary" (Larner & Le Heron, 2004, p. 219) centered on notions of continuity and change (Lury et al., 2012). By virtue of "practices of sorting, naming, numbering, comparing, listing, and calculating", rankings have the effect "to introduce new continuities into a discontinuous world by establishing equivalences or similitudes, and to make and mark discontinuities through repeated contrasts" (Lury et al., 2012, p. 4; see also Espeland & Sauder, 2007). As Lury and colleagues note, this amounts to a radical intensification of patterns of relationality in the guise of continuous comparisons, in which "change is established as constant, normal and immanent" and "forms of economic, political and cultural life are identified and made legible in terms of their capacities for change" (p. 4; see also Thrift, 2004). Ranking itself emerges as an unfolding product and process, constantly moving with that which it seeks to move.

Regulatory ranking and "indexal thinking"

Rankings have become popular ways of "fixing" the global market by seeking to create "markets for collective concerns" (Frankel, Ossandon, & Pallesen, 2016). They are frequently mobilized as forms of soft regulation pursuing the achievement of particular social goals by means of competitive pressures. Such mobilization is more and more visible in transnational governance, where several "regulatory rankings" (Mehrpouya & Samiolo, 2016) have proliferated as forms of civil regulation (Vogel, 2008) in the attempt to "rein in" multinational corporations, resorting to competition as a tool to achieve solutions to socio-economic problems perceived as "global".

The use of rankings in the regulation of public goods has expanded rapidly in terms of the number of such devices and the public goods that they aim to influence. Some prominent "regulatory rankings" include: Access to Nutrition Index, Access to Diagnostics Index, Responsible Mining Index, Access to Seeds Index, Aid Transparency Index, Carbon Disclosure Project, Corporate Human Rights Benchmark, World Benchmarking Alliance, and the Access to Medicine Index (examined here). These devices tend to share similar characteristics: they are developed by private organizations with no public mandate, they are financed by powerful funding agencies (frequently the Bill and Melinda Gates Foundation and European Development Agencies), they aim to define the responsibility of a category of organizations vis-à-vis certain public goods, they involve rituals of stakeholder consultation to mediate between competing views and to set a "middle ground" for measurement, they measure the "performance" of their targets with regards to how well they comply with the "stakeholder expectations" and publish the results of their performance measurement in the form of an index to entice competition. Such regulatory rankings are now emerging as a field of related information and calculative infrastructures with increasingly shared norms of practice. Second-order infrastructures such as "Rate the Raters" (SustainAbility, 2014), which evaluates various regulatory rankings, have further accentuated the normalization of best practices across this field.

Regulatory rankings have specific characteristics that make them stand out from an infrastructural perspective. First, they frequently operate in divided and highly contentious fields, where certain social values are seen as threatened by global market processes transcending state regulation. The stakeholder consultation processes they engage with aim to mend broken stakeholder relations and debates about the underlying public good and to build a consensus. The measurement apparatus of these devices is situated at the midst of such stakeholder politics and consensus-building, civilizing agendas, in which passions are deemed in need taming and interests in need of aligning (Hirschman, 1977). As a result, regulatory rankings normally take the form of an index of performance indicators seeking to represent and line up the interests of different stakeholders. Indexing promotes

the mutual taming of the passions of corporate greed and those of civil society activism (Hirschman, 1977), turning them into rationalized and well-aligned interests represented by different performance indicators. The weighted average performance of each organization ranked (the single figure which is fed into the final ranking) thus underpins a certain balance of interests – a deceptively simple and often fragile politics of indexing as a process of interest alignment.

The small size of the organizations that frequently develop such rankings relative to the global companies they seek to influence further accentuates their political fragility. As a result, regulatory rankings and their underlying infrastructures are particularly exposed to political "shocks" and breakdowns. This leads to frequent episodes where the invisible and ubiquitous categories they operate with become visible (Bowker & Star, 2000). The possibility to absorb such shocks is nonetheless woven in their infrastructural fabric; indices, especially when including large numbers of indicators, are well geared to absorb shocks affecting individual indicators, as the weight of each indicator may well be of little relevance to the final score.

Another significant feature of regulatory rankings is that besides their representational agenda (typical of transparency initiatives) they also have a more explicit interventional agenda. In other words, they openly mobilize the ranking mechanism to try and influence the behavior of their targets. They do not simply aim to inform interested parties through ranking, but to transform the ranked. They are designed to optimize possibilities of behavioral change. Measurement along the lines of various categories is conducted with the aspiration to compile scores and ranks that maximize the possibly of the targets competing against each other. Their calculations are ultimately calculations of agency, promoting particular notions of the ranked organizations as competing "actors" (Meyer & Jepperson, 2000) constantly moving in a trajectory of improvement. Rankings insert the organizations they rank into "differentiated hierarchies" in which the ranked are expected "to constantly reinvent themselves and remobilize their efforts" (Larner & Le Heron, 2004, p. 215).

Rankings, in other words, express capitalism's "will to progress" (Fourcade, 2018) in the guise of benchmarking and performance measurement exercises in which "best practices" are defined and constantly re-set as moving targets. As a result, such initiatives rely heavily on company innovation as the expression of the "exploratory epistemological quality" often ascribed to competition (Davies, 2014, p. 57). Indexing, as a line-up of performance indicators, allows to order and give intelligibility to company practices so as to turn them into regulatory standards, demarcating the innovative and the

"best" from the rest. This creates calculable and actionable entry points into an otherwise intractable space and allows to project from such points a trajectory of improvement[1].

Furthermore, for the excitement of ranking and performance measurement to materialize, for the ranking to matter to its targets and succeed in enticing competition, it should be consumed across the polity by relevant constituencies. Regulatory rankings thus take the form of an "engineered boundary object" (Bowker & Star, 2000) aspiring to have enough "symbolic and material" plasticity to be used among diverse communities of practice, such as regulators, investors, NGOs and the media, orchestrating attention, excitement and information usefulness around the performance calculations produced. Only thus can competition operate as a regulatory mechanism.

Based on the above, we refer to regulatory rankings' preoccupation with *balancing interests and enticing competition* as "Indexal thinking". In what follows, we detail how this indexal thinking structures the "acts of demarcation" (Lezaun, 2006) that (re)define the layered boundaries of the global problem space of access to medicine. We illustrate how ranking contributes to the expansion and elaboration of corporate actorhood (Bromley & Sharkey, 2017; Meyer & Jepperson, 2000), and territorializes the problem space of access to medicine as a "global playground".

Access to Medicine as a global problem space

The problem of access to medicine has a long trajectory of formalization and rationalization, starting as a list of medicines half a century ago (the "essential drugs list" (EDL) of the World Health Organization (WHO), first issued in 1977) to become today a set of variously related problematics, in which the role of the market in providing medicines and the scope of public policies in ensuring access to health have not ceased to be controversial.

The EDL is aimed at guiding WHO member states in defining their procurement priorities. It has promoted the notion that some medicines are more essential than others, highlighting that many medicines (including expensive patented products) in developing countries are not "essential", while certain essential drugs (mostly cheaper off-patent formulations) do not reach populations at need. Its issue, which threatened the interests of pharmaceutical companies, was followed by decades of politicization of access to medicine as a new problem space transcending individual countries (Greene,

[1] Indexing, at its core, is a way of tracing a path of action, of planning a journey through a complex territory. The first indices, the book indices which emerged with the invention of the printing press, seem to have been born as answers to an information overload, as ways to map a body of knowledge perceived as intractable and inaccessible and make it easier to memorize and master (Sttdexi, 2016). This very simple argument points to the role of indices in mapping knowledge perceived as inaccessible, too vast and intricate.

2011; Laing, Waning, Gray, Ford, & t Hoen, 2003). This highly consequential list, which is continuously updated and known today as "essential medicines list" (EML), led in 1980s to a major pushback by the pharmaceutical industry and the US government, which cut its funding of the WHO for two years (Levison & Laing, 2003). This culminated into change of WHO directorship and demotion of the EDL program in the WHO structure.

In the 1980s and 1990s, HIV/AIDS led to a radical intensification and reconfiguration of this politicization. On the one hand, the dramatic spreading of the virus in some low/medium income countries increased their attractiveness for the pharmaceutical companies as fast expanding "emerging" markets. On the other hand, the virus created urgency around the need for a range of new, patented and highly unaffordable HIV/AIDS medicines for large pockets of poor populations (t Hoen et al., 2003). HIV/AIDS, in other words, brought the business model of western pharmaceutical corporations to new non-Western geographies, generating new problem spaces such as equitable pricing and patenting of HIV/AIDS medicines. HIV/AIDS has been one of the factors leading to a push by Western governments, where most of the largest pharmaceutical companies are based, for stringent patent enforcement around the world, which materialized in the form of the TRIPS (trade-related aspects of intellectual property rights) agreement, spearheaded by the World Trade Organization in 1994 (t Hoen et al., 2003).

As a trade agreement that forces member states to implement regulatory platforms for the enforcement of intellectual property rights, TRIPS contributes to lift the access to medicine problem from the international to the global level. The WHO's EDL/EML has been developed for the nation state as primary user, in order to guide the development of national health policies. The WTO's TRIPS agreement, too, stems from the inter-governmental sphere and seeks to guide national policies, but as a binding harmonization project to remove barriers to trade, it mobilizes national policies in favor of the property rights of global companies, harnessing national sovereignties to the creation of "global" markets. As Traub-Werner notes, "projects of harmonization written into trade agreements make commensurable spaces thinkable at a supranational scale" (2007, p. 1443). With TRIPS, certain aspects of access to medicine (in those instances in which it requires to breach the intellectual property rights of pharmaceutical companies) become an obstacle to the free trade, bringing to the fore the pharmaceutical corporation as a sort of competing sovereignty to that of the nation state (a notable example is the lawsuit filed by 39 large pharmaceutical companies against the government of Nelson Mandela in South Africa in the late 1990s for its imports of generic anti-retroviral drugs). In this shift, the access to medicine problem escalates into a transnational arena of clashing sovereignties.

In late 1990s rising "global" civil society actors such as Doctors Without Borders played a key role in driving such clash, documenting the detrimental effects of patent enforcement for access to medicine across the world, and enrolling various national entities in the global "access to medicine campaign", which has now developed into a dense transnational community (Greene, 2011).

In the early 2000s, for the first time, the notion of a global space of need for access to medicine could be calculated and summed up as a single figure, defined by the United Nations as "2 billion people lacking access". This number has since played a central role for various access to medicine organizations, including the Access to Medicine Foundation, helping them carve out and motivate their diverse missions within this field.

The Access to Medicine Index

Since its launch in 2005, through a bi-annual stakeholder consultation and ranking exercise, the Access to Medicine Index (from now on "the Index") has attempted to reconcile the competing/conflicting views of NGOs, investors, Southern and Western governments, IGOs (especially the WHO but also the United Nations), patients, and companies themselves, guided by the urge to carve out a space of consensus in which measurement could take place. Now it its sixth iteration, the Index has become a central arena for debating the responsibilities of pharmaceutical companies with regards to access to medicine and their comparative performance in this area.

The Access to Medicine Foundation, based in the Netherlands, has taken on this consensus building role against the background of a field fraught with litigation and scandals, with pharmaceutical companies pushing for more stringent enforcement of patents, and Southern governments, NGOs and generics companies (mostly Indian) campaigning against it (t Hoen et al., 2003). Patents are only one of the many issues (alongside affordable pricing, research and development for diseases of the poor – or "neglected diseases", marketing, lobbying & competitive practices, and the like) forming the blurred boundaries of the problem space of access to medicine. The Index Methodology Report, issued every two years, actively seeks to demarcate such problem space, and the contested responsibilities of pharmaceutical companies in addressing it, by listing the diseases and countries which form its scope and a set of indicators to measure companies' behavior within that scope.

Each Index cycle starts with stakeholder consultation leading to the launch of the updated Methodology Report. This is followed by several months of data collection, analysis and scoring, which culminate in the release of a ranking of 20 of the largest pharmaceutical companies, seeking to

mobilize market forces and the ascribed competitive agency of firms to entice them to move towards their "stakeholder-mandated" responsibilities. In this governance scheme, firms are deemed to care about the ranking and engage in "virtuous competition" if powerful stakeholders, including investors, regulators and large NGOs, use the Index in their actions vis-à-vis the industry.

In order to create zero-sum games among the ranked organizations (Espeland & Sauder, 2007; Werron, 2015) such organizations need to be made comparable by means of common measures (Espeland & Stevens, 1998). A key measure chosen in the case of the Access to Medicine Index as the basis for the inclusion of companies in the ranking was company size, measured in terms of pharmaceutical revenues. The company scope chosen as relevant to the global problem of access to medicine was thus based on a simple financial accounting measure. Yet this measure brought into the competitive space of the Index companies with widely different business models, whose commensuration has been at times problematic. For example, the Japanese companies, which have been included in the Index since 2010, had limited activity outside the Japanese and US markets. They thus demanded to be held to a different standard compared to the Western companies in the Index, as their impact on global access to medicine was necessarily reduced by their limited geographical footprint. However, the Index methodology rejected this kind of reasoning, promoting instead the view that such companies' limited geographical scope was a sign of lack of attention to the social case for access to medicine, and, importantly, it meant missing out on growth opportunities in those emerging markets (business case).

Using revenues as a basis for commensuration tossed these companies into a global "level playing field" in which access to medicine is framed as a global social problem and a global business opportunity demanding their strategic efforts. The Index thus sustains a discursive realm in which the strategic horizon of pharmaceutical companies is expanded, casting those who do not take up the challenge of emerging markets as losers in a global game. A certain global imagery and the benchmarking logic permeating the ranking thus contribute to turn an abstract calculable space – a list of countries – into a territory that can be governed according to specific rationales, where the health of different populations is matched to the business model of global pharmaceutical companies (as we detail below), and where the ascribed agentic features of the latter are expanded in the process.

The latest Methodology Report defines 77 diseases as Index Diseases and sets 106 countries as Index Countries. Companies are ranked for their activities across 69 indicators organized under seven Technical Areas. In the process of the formulation of these indicators, several new technical categories have been defined to make diverse and dispersed events and instances of practice tangible,

traceable, measurable and comparable at the global level. The Technical Areas used to structure the Index's problem space are listed below. Each comprises several indicators, further categorized under Commitments, Transparency, Performance and Innovation indicators (the latter four sub-categories are termed "Strategic Pillars") (ATMF, 2017, p. 8):

- General Access to Medicine Management
- Market Influence & Compliance
- Research & Development
- Pricing, Manufacturing & Distribution
- Patents & Licensing
- Capacity Building
- Product Donations

The Index's measurement apparatus has been developed with the imperative of balancing in mind. It seeks to "measure in the middle" of a divided stakeholder base. It thus includes indicators with stronger or weaker business case attributed to them, which sit uneasily within the same index. Companies are to be shown a way forward through the indicators which make up the index, but they are also expected to lead the way though the innovative practices those indicators seek to capture. The Index set out to harness pharma's "knowhow" to achieve the United Nations' Millennium Development Goals (and more recently the Sustainable Development Goals) (interview with the Founder of the Access to Medicine Foundation, 2013), resorting to competition as a way to produce new knowledge (Davies, 2014) and mobilizing market innovation as a regulatory mechanism (Brown, 2015).

Innovation indicators constitute a "Strategic Pillar" within the calculative infrastructure of the ranking. The Index analysts actively seek out examples of innovative company practices, which are also heavily reflected in the narrative part of the Index Report. The Index tries to detect and integrate such emerging practices so that competition can lead to their diffusion in the sector. It "harvests" such practices, which are company-specific and often country-specific, from their emplacements, and absorbs them into its calculative infrastructure so as to normalize newly expanded scripts for corporate action. Innovative company practices are the visible boundary of access to medicine in the making, a moving boundary in the trajectory of improvement traced by the Index. In this way, the Index absorbs the new, and the alleged spontaneity of "free" market innovation is turned into a soft regulatory standard.

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In each iteration of the Index, the Methodology Report highlights this trajectory, (re)adjusting the calculative boundaries of Index countries, diseases and indicators in order to reflect improvements from previous iterations and create the scope for further ones. In so doing, it continuously (re)establishes the high priority areas for access to medicine and the more urgent stakeholder expectations from the pharmaceutical companies. The territorializing work at play in re-setting the boundaries of the access to medicine problem space constantly redefines the strategic horizon of the corporation whilst also creating a layering of superposing territories where "high priority" categories are selectively foregrounded within such problem space. It is to this territorializing work that we now turn.

Territorializing a Global Need

The first iteration of the Index (2008) did not have a well-demarcated territory. It captured and scored all company activities that seemed to be broadly linked to the accessibility of needed medicines in poor countries and communities. The territory and content of access to medicine in Index 2008 was, as a result, highly reliant on the practices of the companies. Since Index 2010, the Index analysts have set out clear boundaries around the geographical and disease scope of the Index. This has helped define the range of relevant practices for scoring all twenty companies and establish the Index as a level-playing field. The setting of the disease and country scope also aimed to concretize the areas of need separately from the responsibility of the companies (defined by the Index indicators). The competitive mechanism underlying the Index would then help stretch the boundaries of company responsibility in the direction of covering the full territory of need over several iterations of the Index.

The Access to Medicine Index relies on various secondary global infrastructures, such as the WHO's Global Burden of Disease database, the WHO's International Classification of Diseases, United Nations' Human Development Index and the World Bank's Country Income Classifications, to concretize the geographical, disease and product boundaries of this need. Over the years, the Index analysts have used different ways of combining these classifications in a way that would be acceptable to the Index's constituencies, including the WHO, the broader global access to medicine community but also the companies themselves. At stake are the normative foundations of such secondary infrastructures, and how they can be mobilized in a way that would be consistent with the intuition of the analysts and the diverging claims of various constituencies.

Infrastructural Patchwork – Expanding the Diseases of the Poor

The boundaries of the access to medicine need have been frequently contested and adjusted over the years. The country scope and disease scope of the Index have both expanded over time (from 88 countries in Index 2010 to 106 in Index 2018, and from 33 diseases in Index 2010 to 77 diseases in Index 2018). At stake has been not only setting new areas of company responsibility, but more fundamentally in some cases, the definition of what a disease is.

The disease scope has been defined since Index 2010 based on the WHO's International Classification of Diseases (ICD), its "Global Burden of Disease" database. The former attempts to classify all human ailing and the latter conducts a measurement of the mortality and morbidity burden each disease causes in each country based on Disability-Adjusted Life Years (DALYs) lost to the disease. DALYs are measured at country level and aim to influence national policies. To use them for defining the "global" territory of the access to medicine problem, and to make them relevant to the "global corporation", the analysts aggregate the DALY figures across all Index Countries. The Index then covers the top non-communicable diseases (currently fourteen) and top communicable diseases (currently twenty-one) based on these figures, and adds to the list certain maternal and neonatal health conditions (currently ten) and the so-called "neglected tropical diseases" (currently twenty). The latter are insect-borne diseases mostly exclusive to tropical climates. Several of these diseases do not have very high DALYs associated to them because of the limited number of countries where they occur. To cover them, the Index has to make an exception to the DALY-based calculation, referring to the WHO's focus on these diseases to justify the exception.

The disease scope of the Index is fundamentally structured around the goal to set a clear and calculable global space that would provide the level-playing field in which companies, enticed by their single global score and ranking, could engage in competition. As a result, diseases that remain too localized and do not lend themselves to global comparisons tend to be excluded.

This clear and calculable space has been subject to multiple adjustments over the years. One important debate has been the differentiation between communicable (or infectious) diseases, including Tuberculosis, Malaria, HIV/AIDS, neonatal infections and Hepatitis, and non-communicable diseases such as cardiovascular diseases, diabetes, cancers and psychological diseases. The former have been historically referred to as the diseases of the poor and the latter as those of rich countries. Lack of health infrastructure to deal with non-communicable diseases (mostly chronic) and low life-expectancy in "poor countries" (people dying before they can be affected by major non-communicable

diseases) have been two arguments behind focusing on communicable diseases. The access to medicine need was thus originally associated with poverty and its most visible correlate – mortality.

However, most of the drug development of the large western pharmaceutical companies has been focused on the lucrative non-communicable diseases markets. The notion of "emerging markets" first, and the rise of the BRICS category afterwards (Fourcade, 2013; Wansleben, 2013), have led to a reframing of the notion of "poor countries". In these "emerging" economies part of the society has already "emerged" and as a result is affected by non-communicable diseases, while the other part is still "poor" and afflicted with communicable diseases. In global health language, this is referred to as "the Double Burden of Disease". The language of Double Burden of Disease, in other words, led to a re-territorializing of the diseases of the poor, with non-communicable diseases moving increasingly to the center stage. Since around 2010, the WHO has put much more emphasis on non-communicable diseases in the debates around access to medicine. Over the years, the Index has followed suit and has expanded its coverage of non-communicable diseases. Attention to "emerging economies" and non-communicable diseases has also helped emphasize the "business case" for access to medicine in a way that would resonate with investors and companies themselves. As demonstrative examples, below we elaborate on the territorialization work involved with regards to contraceptives, hepatitis and cancers.

As to contraceptives, they were not covered in the first iterations of the Index (2008 and 2010), because they did not address a "disease" as defined by the ICD. Furthermore, contraceptives were considered problematic in areas where HIV/AIDS was endemic, because they could lead to decreased use of condoms and some studies associated injectable contraceptives with increased risk of the transfer of HIV (Heffron et al., 2012). The advocates of inclusion in contrast emphasized the importance of contraceptives to decreasing maternal/infant mortality. One key group advocating the inclusion comprised of companies active in production and distribution of contraceptives, such as Bayer, which were eager to see their access initiatives in this area recognized. From Index 2012, contraceptives have been included through association with maternal morbidity and mortality, which are classified under the ICD (arguing that unwanted pregnancies can lead to precarious maternal care and maternal morbidity/mortality). Contraceptives were an alien category "patched" into the information infrastructure of the Index and "naturalized" through its "filiation" with a category already existing in the infrastructure – that is, maternal health. Such filiation establishes a new pattern of relationality, a causality relation between an issue space that needs to be naturalized (in this case contraceptives) and categories that are already naturalized (in this case maternal health).

Hepatitis is another disease whose inclusion has taken several years and intense categorical work to be settled. Based on burden of diseases calculated in DALYs, different types of Hepatitis had to be excluded because neither of them causes sufficient mortality in Index countries to be placed among the top communicable diseases. With Index 2010, however, the analyst team decided to aggregate different Hepatitis categories (B and C) and cover them under Cirrhosis of liver, which can be caused by Hepatitis but has also many other causes such as alcohol induced fatty liver. The 2014 Index Methodology Report mentions: "coverage of cirrhosis of the liver has been broadened to include chronic viral hepatitis, as it can develop into cirrhosis of the liver" (ATMF, 2013, p. 15). This was however a problematic classification, because Hepatitis is a "communicable" or infectious disease, while Cirrhosis of the liver is classified by the WHO's ICD as a non-communicable disease. This patching of Hepatitis into the Index's classification system based on a causality relation happened at a time when many companies were active in developing vaccines/drugs for Hepatitis, and this particular illness was also being emphasized by the WHO. This classification was however problematic because the WHO and other international organizations articulate their policies based on a strong differentiation between communicable diseases and non-communicable diseases.

As a result of this misclassification issue, in 2018 the approach for coverage of Hepatitis changed. Hepatitis B and Hepatitis C were declassified from under Cirrhosis and were instead covered as a separate aggregate category of "viral Hepatitis" under communicable diseases (ATMF, 2017, p. 25). This addressed the classification issue (from non-communicable to communicable disease category). Resorting to an aggregate disease category made Hepatitis stand out for the first time in the information infrastructure of the Index (where it had previously remained hidden under the category of Cirrhosis of liver). As with contraceptives, the inclusion of hepatitis within the Index scope involved patchwork based on "naturalization" of hepatitis through "filiation" with existing categories, and aggregation of types B and C into one category.

In the case of cancer, in the earlier iterations of the Index, guided by WHO input, the analyst team decided not to cover its remedies. Such drugs were considered expensive, not sufficiently efficacious and effective and, importantly, they required diagnostic/therapeutic infrastructure that was lacking in many Index countries. The 2010 and 2012 Index Methodology Reports discuss disease coverage based on calculations of disease burden, but do not engage in a specific discussion about the exclusion of cancers. The Methodology Report for Index 2014 justifies the exclusion of cancer for the first time, "as the disaggregated DALY burden for individual forms of cancer did not meet the criteria for inclusion (burden of 13,000 DALYs per 100,000)" (ATMF, 2013, p. 15). The Methodology Report for Index 2016 clearly acknowledges the stakeholder demands to cover cancers, and the WHO's increased coverage of cancer medicines in its Essential Drugs List. However, the 2016 methodology continued

excluding cancers, arguing that "Lower-income countries are less likely to have the support systems in place that are needed for effective treatment, and in fact may be more likely to suffer from stock-outs of the older, generic medicines needed" (ATMF, 2015, p. 13).

Following the increased emphasis placed on cancers by the WHO, Index 2018 finally started to cover them. Cancers have been included as an exception to the calculations. The 2017 Methodology Report, while detailing disease burden calculations, mentions that "[a]n exception to this approach is cancer: cancer types are included if they (a) have high burdens of disease or (b) have relevant medicines on the WHO List of Essential Medicine" (ATMF 2017, p. 25).

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Cancers, in other words, moved from exclusion based on DALY calculations with no visibility (Index 2010 and 2012), to visible exclusion based on DALY calculations (Index 2014), to visible exclusion based on qualitative arguments (with one page of the Methodology Report for Index 2016 dedicated to the issue), to inclusion in Index 2018, based on references to the WHO's EML. Cancers provide an example of infrastructural patchwork involving "denaturalization" of a category through the shrinking of a problem space based on calculative disaggregation, followed by its stepwise naturalization into the Index territory in subsequent iterations of the Index.

Such infrastructural patchwork was pervasive in the categorization work of the analysts. Analysts resorted to aggregation, disaggregation and filiation to patch or "un-patch" different diseases into the Index's disease scope. Such techniques play an important role in naturalizing and denaturalizing different aspects of the access to medicine problem in a conversation with changing debates and classifications in the sphere of global health (e.g. Double-Burden of Disease), with important consequences for how the various territories and sub-territories of the access to medicine need are configured as areas of corporate responsibility and inter-company competition.

Infrastructural Collage - Expanding Geographies of Need

The country scope of the Index is based on various development and income indicators which are defined at country level. As a result, such scope is based on the unit of "countries", lumping together the diverse access to medicine needs of very large and heterogeneous regions and populations, such as those of Brazil, Bangladesh and India.

The dominant secondary infrastructures in this area are the Country Income classification of the World Bank and the Least Developed Countries (LDC) listing and Human Development Index (HDI) of the United Nations. These indices provide different visualizations and orderings of countries. The World Bank Country Income classification is primarily driven by economic indicators, while the HDI is considered as an alternative which aggregates a broader set of social measures pertaining to areas such as healthcare, education and governance (with HDI being typically supported by NGOs).

Since 2010, different forms of "infrastructural collage" have enabled the combination of these secondary infrastructures. By infrastructural collage we mean categorical work based on superimposition and layering of different secondary infrastructures (see also Reilley & Scheytt, this volume), allowing for different ways of combining their respective categorizations, and thus for selectively foregrounding certain elements and backgrounding others.

For Index 2010, analysts included the HDI low and medium development countries, while excluding countries with medium-high to high income levels as defined in the World Bank classification. The exclusion of medium-high and high income countries was done on the basis that these countries have the economic resources to address their healthcare challenges and as a result they are not "high priority". This, however, led to excluding "BRICS countries" such as Brazil and South Africa, which have large pockets of poor and uninsured populations, as well as resource-rich Sub-Saharan countries with major healthcare challenges such as Gambia and Namibia.

Following the launch of Index 2010, several constituencies voiced criticism of this exclusion. For example, the WHO representative expressed concerns about the exclusion because of the centrality of such large countries to global health policy and also their large pockets of poor populations. Another key voice was that of companies with access to medicine initiatives in those excluded countries, which sought to improve their positions in the ranking by having more of their initiatives covered. The exclusion of Brazil, for example, led to the exclusion of Merck's initiatives related to the Human Papilloma Virus vaccine (Gardasil) in Brazil.

As a result of such pressures, since the 2012 the Foundation has adjusted the way it mixes and matches those secondary infrastructures for country classification, so as to ensure that its country scope is aligned with companies' practices, perceived access to medicine needs in those countries, and related failures in their health infrastructures. This is how the country scope of Index 2018 is defined (ATMF, 2018, p. 223):

> The geographic scope for the 2018 Access to Medicine Index comprises 106 countries. All countries defined by the World Bank as low income or lower middle-income are included. All

> countries defined by the UNDP as either low or medium human development are included. This ensures that several central measures of human development (life expectancy, education, and standard of living) are taken into account. All countries that receive a score of less than 0.6 on the UN Inequality-Adjusted Human Development Index are included. This measure takes account of how health, education and income are distributed within each country. Finally, all Least Developed Countries (LDCs), as defined by the Committee for Development Policy of the UN Economic and Social Council (ECOSOC), are Included.

This marks a reconfiguring of the infrastructural collage underlying Index's country scope. As in Index 2010, three secondary infrastructures are combined, but this combination is now inclusionary. The sets of countries defined by each of the three infrastructures now form a union rather than an intersection. In other words, no infrastructure is used to exclude categories in another infrastructure.

Defining the country scope based on the inclusionary collage of those infrastructures is politically less risky; it might lead to territorial "over expansion", but it is much less likely to lead to controversies related to the exclusion of countries, which may stem from pressures from companies with initiatives in those countries or from changes to international health policy or development classifications. This example illustrates how discrepancies among the Index's secondary infrastructures, their perceived limitations, and pressures from companies are mediated through categorical work. Through this process of superimposition and collage, large pockets of population are moved in and out of the Index's scope with each iteration of the Index.

Interestingly, such processes are mostly expansionary and integrative. The increased coverage of diseases and countries is highlighted in the first pages of each Index report and is presented as a sign of the Index's growth and success. Seen from the lenses of "thinking infrastructure", however, this expanding territory can also be seen as a function of the aspiration to govern through competition and innovation. When companies create pressures to see the diseases and the countries in which they are active recognized, the aspiration to harvest new examples of innovative practices can lead to much more intense categorization and classification efforts to evaluate whether those practices can be included, causing an overflow of competitive pressures back into infrastructural design. When company activities resonate with the international health policy and development debates illustrated above, changes to the Index disease and country scope acquire justification and momentum. Such resonance solidifies certain implied causality relations, allowing for new patterns of relationality to provisionally stabilize. The boundary of the Index, and the access to medicine territory, can thus shift.

Indexal Thinking and Global Playgrounds

Regulatory rankings such as the Access to Medicine Index are at the forefront of attempts to manage divisive "global" issues through market-based organizing and to regulate them through consensus-building and competition, contributing to the marketization of transnational governance regimes (Djelic & Sahlin-Andersson, 2006). They underpin "infrastructures of referentiality" (Latour, 1999) through which diverse "local" practices become traceable at the global level (Lezaun, 2006). Such infrastructures also have the potential to re-territorialize the global by making it actionable according to specific rationales, through processes of measurement, comparison and competition revolving around those global references.

We have illustrated how various categorization, classification and commensuration processes enabled the transformation of the fragmented and contested problem space of access to medicine into an ordered, indexed, calculable and unfolding territory for governing through competition and innovation, where the "calculable understanding of [this] space has been extended to the globe" (Elden, 2005, p. 2). The infrastructural lens we adopted enabled us to foreground "what makes this space possible and therefore allows it to be produced, reconfigured and transformed" (Elden, 2005, p. 19), supporting our understanding of the highly performative web of constructs and processes that enable, maintain, expand, densify and territorialize the global.

Our analysis also points to specific ways in which the global as an abstract calculable space may be turned into territory through infrastructure: bounding it (through listing countries and diseases to be included and excluded), selectively foregrounding its features (e.g. from an exclusive focus on mortality to the inclusion of morbidity, introducing certain diseases like neglected tropical diseases by exception), and composing and binding these features together (e.g. through categorical patchwork and collage) in variable patterns of relationality in which the "thinking" underlying the infrastructure temporarily solidifies.

The "indexal thinking" permeating the ranking, the ambition to govern the global through consensus and competition, shapes the emerging territory of access to medicine in important ways. Firstly, such territory is configured as a "level playing field" where the competitive game can be deemed "fair" (Davies, 2014). For competition to be considered fair, the boundaries of performance measurement, including the selection of competitors, have to be clear. The competitors need to know who and what is counted or not, to be able to judge the fairness of the comparison. Yet, as the case of Japanese companies illustrates, this judgment of fairness and thus the Index territory may well be contested. The matching of the "global" competitive field to companies (through commensuration based on company revenues) was perceived as unfair by Japanese companies, whose activities tended

to be "regional" and less relevant to the Index's more global scope. Yet, in principle at least, including Japanese companies in the Index and holding them to the same standard as other, more global companies stretches the strategic horizons and business models of those regional companies, generating new external expectations in the name of the global. In this way, the ascribed agentic features of participating companies are expanded (Bromley & Sharkey, 2017; Meyer & Jepperson, 2000).

Secondly, the aspiration to regulate through competition and establish company innovations as industry standards means that the innovative practices signaled by companies are given much attention and consideration, leading to an intensification of categorical work. Innovative practices are the "cutting edge" through which the boundaries of companies' responsibilities expand by harnessing the market's imagined creativity and freedom to innovate (Davies, 2014). Corporate actorhood is expanded, yet again. The urge to search for and capture new initiatives constantly brings into the field of vision of analysts also innovations that fall outside the current scope of the Index. The competitive urge enticed by the Index, in other words, overflows back into the Index infrastructure, creating pressures at the boundaries of its territory. Such "competitive overflows" are one of the reasons behind the gradual expansion of the ranking's problem space over the years. Absorbing innovations into the infrastructure of regulatory rankings is one of the engines behind the amoebic expansion of their territories, one which, as we have seen, requires an intensification of categorical work and measurement through patchwork and collage.

As discussed, this work succeeds in moving the boundaries of the access to medicine territory when innovative company initiatives find resonance with international health policy and development debates and categories, matching areas of need with economic excitement.

Such excitement, companies' presumed urge to compete based on which regulation can happen through ranking, is enticed by ensuring that the ranking is relevant to important company stakeholders. This is a third important aspect of the "indexal thinking" underlying regulatory rankings. At stake here is not only carving out a role for the corporation in areas which have been historically under the exclusive territory of state sovereignty, replacing the command and control vertical order of the latter with the level playing field of competition. Regulatory rankings also attempt to engage various stakeholders, including investors, NGOs and Southern governments, whose decisions have the power to influence companies. Categories such as "double burden of disease" have been especially impactful in terms of moving the boundaries of the Index and reconciling the interests of different constituencies. They can appeal not only to health policy communities but also to companies or investors (by making drugs developed for Western markets relevant to Index countries), potentially

engaging and activating influential groups within the Index's stakeholder base. Regulatory rankings are, in other words, infrastructures in which the behavior of the ranked is calculated as an equation of interlinked actors and scripts for action.

We can think of this evolving territory informed by indexal thinking as a "global playground" in which the excitement of competition replaces political conflict in the defense of public goods. The boundaries of this playground need to be clearly set, yet moving, as a function of innovation and competition and of the orchestration of different actors whose interests and views need aligning and whose strategic horizons need expanding through a competitive game. This constant motion, which the Index both induces and becomes a product of, has important stakes. Its direction is selective, and its changing boundaries carry a politics of inclusion and exclusion.

The different country classifications used to define the country scope, based on their underlying values and calculative regimes, make certain local aspects visible while obscuring others. As shown, such secondary infrastructures can be collaged in different ways. In the case of the Index, there has been a transition from intersection to union of sets and thus a more inclusionary logic which avoids controversial exclusions such as those of Brazil and South Africa in 2010, when intersection was used instead. Along similar lines, the disease scope of the Index has evolved in a conversation with international health policy debates and categories. These have provided the rules (DALYs) and the exceptions (as in the case of neglected tropical diseases) for setting such scope, requiring intense infrastructural patchwork to rationalize inclusions and exclusions. Analysts resorted to the aggregation and disaggregation of the DALY figures of different diseases, or else to filiation of diseases which are outside the Index territory from diseases which are inside it (e.g. filiation of Hepatitis from Cirrhosis), to naturalize or de-naturalize particular diseases within the calculative infrastructure of the Index.

At play in such territorialization is a transformation of the face of the "global poor" and of the government of poverty. As shown, there has been a shift ~~in the global health~~ in the articulation of the access to medicine need from an almost exclusive focus on communicable diseases to a dual focus on communicable and non-communicable diseases, the aforementioned "double burden of disease", which combines the traditional diseases of the "poor" with those of the "rich" Western Countries. This integration reflects a more general shift in postcolonial global health discourses, which, contrary to their colonial antecedents, are no longer primarily concerned with "converting" the poor to Western medical theories and practices in the name of humanitarianism – such conversion is now largely taken for granted. "[T]he goal is no longer to bring modern Western medicine to primitive cultures, but rather to furnish them with Western medical technologies in an effort to foster the integration of underdeveloped nations into the world capitalist economy" (King, 2002, p. 780). The dominant

metaphor of such discourses is, according to King, one of emergence and integration of the poor "into global networks of commodity and information exchange" (p. 782), which the Access to Medicine Index, as we have seen, is preoccupied with.

The biopolitical shift from acute to chronic and from mortality to morbidity in international health policy, predicated on a discourse of emergence from poverty and partial improvement, has made the vast volumes of pharmaceutical products directed at Western markets become relevant for the "Index Countries". In this respect, addressing access to medicine as a "global problem" has become more financially exciting for companies and investors. The promise of "unknown opportunities" which characterizes the rhetoric of BRICS (Wansleben, 2013) is thus realized. "Emerging markets" have acted as crucial bridging concepts through which the problems of the poor have been articulated and integrated into those of the Western countries, with the indirect consequence of bringing the problem space of access to medicine closer to the business model of Western companies. Emerging economies are especially "actionable" from the perspective of the industry; they are instances in which the formal balance of interests sought by the Index turns into an alignment in which what can be easily aligned to global health policy and development discourses stands out and succeeds in moving the boundaries of the Index.

To conclude, through the example of a regulatory ranking, our study has sought to illustrate the important role that seemingly mundane infrastructural processes play in defining and transforming the territories of global governance. Our preoccupation has been the ways in which rankings, as "thinking infrastructures", affect the territories of need that global corporations are deemed to help address, making those territories actionable according to the logics of consensus, competition and innovation, expanding the ascribed responsibilities and strategic horizons of those corporations in the process.

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Figure 1. Access to Medicine Index 2018 ranking graph (ATMF, 2018)

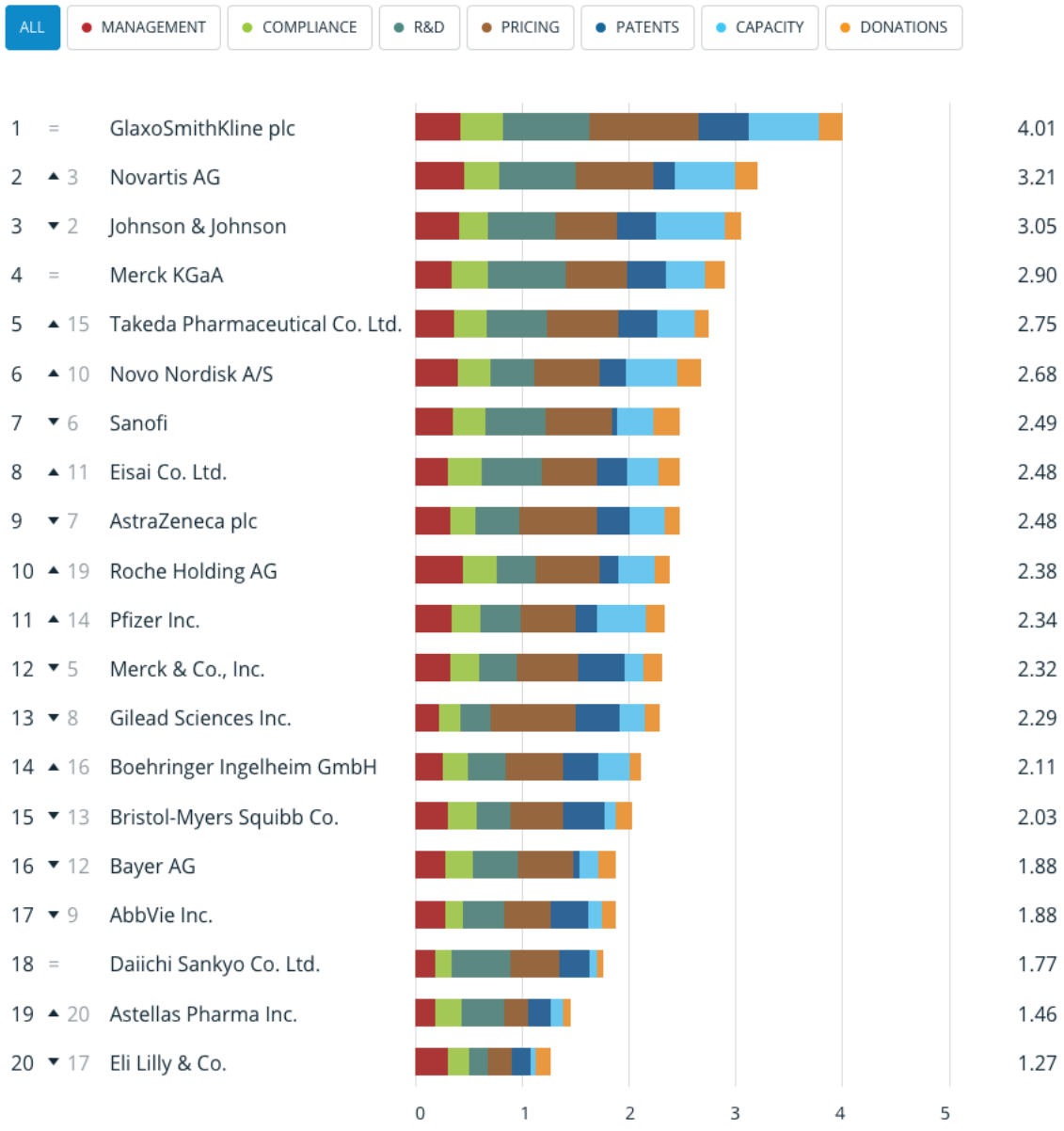
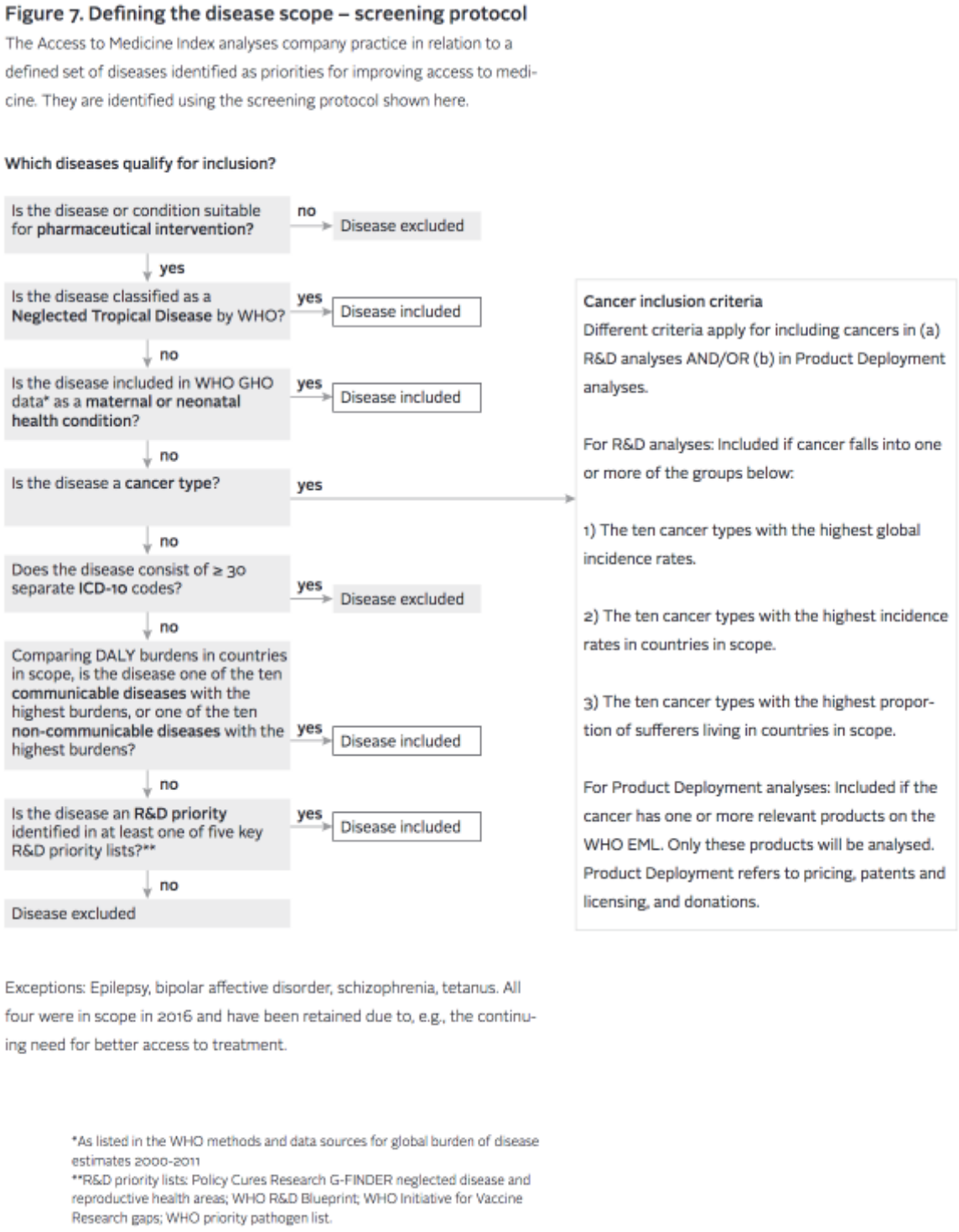


Figure 2. Process for inclusion of diseases in Index Territory (ATMF, 2017, pp. 25-26)



Disease	Global DALYs[7]
Communicable diseases (10)	
Lower respiratory infections	94,511
Diarrhoeal diseases	72,777
HIV/AIDS	58,513
Tuberculosis	34,217
Malaria	33,976
Measles	14,853
Meningitis	11,426
Pertussis	9,882
Tetanus	5,283
Chlamydia	3,748
Non-communicable diseases (12)	
Unipolar depressive disorder	65,472
Ischaemic heart disease	62,587
Cerebrovascular disease	46,591
Chronic obstructive pulmonary disorder [COPD]	30,196
Diabetes mellitus	19,705
Schizophrenia	16,769
Asthma	16,317
Osteoarthritis	15,586
Bipolar affective disorder	14,425
Cirrhosis of the liver	13,640
Nephritis and nephrosis	9,057
Epilepsy	7,854
Neglected tropical diseases (17)	
Lymphatic filariasis	5,941
Soil transmitted helminthisiasis	4,013
Leishmaniasis	1,974
Food-borne trematodiases	1,875
Schistosomiasis	1,707
Trypanosomiasis	1,673
Rabies	1,462
Trachoma	1,334
Dengue	670
Cysticercosis	503
Chagas disease	430
Onchocerciasis	389
Leprosy	194
Echinococcosis	144
Buruli Ulcer	N/A
Yaws	N/A
Dracunculiasis	N/A

Disease	Global DALYs[7]
Maternal and neonatal health conditions (8)	
Abortion	7,424
Maternal sepsis	6,535
Maternal haemorrhage	4,439
Obstructed labour	2,882
Hypertensive disorders of pregnancy	1,888
Prematurity and low birth weight	44,307
Birth Asphyxia and birth trauma	41,684
Neonatal infections and other conditions	40,433
Contraceptive methods	NA

14 Diseases/conditions added to or expanded in the 2014 Index scope